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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,882	09/30/2003	Daniel G. Borkowski	INTCP002	6776
45460	7590	12/20/2006		
JUNG-HUA KUO C/OINTELLEVATE P. O. BOX 52050 MINNEAPOLIS, MN 55402			EXAMINER FRANKLIN, RICHARD B	
			ART UNIT	PAPER NUMBER
			2181	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/20/2006	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/675,882

Applicant(s)

BORKOWSKI ET AL.

Examiner

Richard Franklin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

FRITZ FLEMING

SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Claims 1 – 30 are pending.

***Continued Examination Under 37 CFR 1.114***

2. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

***Response to Arguments***

3. Applicant's arguments filed 10 October 2006 have been fully considered but they are not persuasive.

Applicant argues that there is a lack of motivation to combine the relied upon references US Patent No. 5,953,020 (hereinafter Wang) and US Patent Application Publication No. 2003/0177164 (hereinafter Savov). Applicant argues that the environments of Wang and Savov are different. However, Savov is not relied upon for its physical structure. Savov is instead relied upon for explaining differences in terminology. Savov is used to relate the "counter" of Wang to a "semaphore." Therefore, combining the teachings of the two references and not the physical structure, as the Examiner has done, is proper.

Applicant also argues that the relied upon references do not teach computer code that is operable to implement a FIFO using a counting semaphore. Applicants allege that Wang teaches only simulation of FIFO characteristics, which is different than computer code that actually implements a FIFO. However, Wang does teach these limitations. Specifically Wang teaches "The virtual FIFO controller 68 is a system having **software** and hardware components and controls the timing of write request 28 to the display FIFO memory 70 based on the prediction of the number of remaining register entries" (Wang; Col 4 Lines 63 – 67) (emphasis added). Therefore, Wang teaches software that is used to implement the FIFO. Also, Wang teaches operating a

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FIFO based on the simulation of the FIFO characteristics, and therefore teaches implementation of a FIFO.

In light of the above arguments, the previous rejection is maintained.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 – 19 and 21 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,953,020 (hereinafter Wang) in view of US Patent Application Publication No. 2003/0177164 (hereinafter Savov).

As per claims 1 and 11, Wang teaches a method comprising receiving a request to write data to a FIFO (Wang; Col 7 Lines 46 – 52 [write request signal]); determining whether the FIFO is full by comparing the value with a predefined maximum value (Wang; Col 8 Lines 21 – 30); and if the value is less than the predefined maximum value: incrementing the counting (Wang; Col 8 Lines 12 – 20); and writing data to the FIFO (Col 8 Lines 21 – 30).

Wang does not explicitly teach the term “counting semaphore.”

However, Savov teaches a counting semaphore (Savov; Paragraph [0014]).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Wang to include the term "counting semaphore" because doing so would allow data to be "thread-safe," or protected from simultaneous modification by different threads (Savov; Paragraph [0013]).

As per claims 2 – 3, and 12, Wang also teaches receiving a request to read data from the FIFO (Wang; Col 7 Lines 46 – 52); reading the data from the FIFO (Wang; Col 8 Lines 21 – 30); and decrementing the counting (Wang; Col 8 Lines 12 – 20).

As per claim 4, Wang also teaches receiving a request to read data from the FIFO (Wang; Col 7 Lines 46 – 52); determining whether the FIFO is empty by comparing the value with a predefined minimum value (Wang; Col 8 Lines 21 – 30); and if the value is greater than the predefined minimum value: reading data from the FIFO (Wang; Col 8 Lines 21 – 30); and decrementing the counting (Wang; Col 8 Lines 12 – 20).

As per claim 5, Savov also teaches wherein incrementing and decrementing are atomic (Savov; Abstract).

As per claim 6, Wang also teaches wherein if the value is not less than the predefined maximum value: discarding the data that was to be written to the FIFO (Wang; Col 8 Lines 21 – 30 [no data is written]).

As per claim 7, Wang also teaches wherein if the value is not less than the predefined maximum value: blocking further execution of a process that made the request to write data to the FIFO until the value is less than the predefined maximum value (Wang; Col 8 Lines 3 – 52).

As per claims 8 – 10 and 28 – 30, Wang and Savov also teach a counter (Wang; Figure 3 Item 82), at least one comparator for comparing (Wang; Figure 7 Items 156 and 160) an output of the counter with a predefined value and generating one or more signals based on the comparison (Wang; Col 9 Lines 11 – 23); and that a counting semaphore is implemented using special-purpose hardware (Savov; Paragraphs [0014] and [0064]).

As per claim 13, Wang teaches an engine comprising one or more coprocessors (Wang; Figure 2 Item 64; Col 4 Lines 58 – 67); a memory (Wang; Figure 6 Item 16); signal generation logic for signaling the status of a FIFO (Wang; Col 8 Lines 3 – 52); and computer code stored in said memory, which, when executed by one or more of said coprocessors, is operable to implement a FIFO using said signal generation logic (Wang; Col 4 Lines 63 – 67 and Col 8 Lines 3 – 52).

Wang does not explicitly teach the term "counting semaphore."

However, Savov teaches a counting semaphore (Savov; Paragraph [0014]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Wang to include the term "counting semaphore" because doing so would allow data to be "thread-safe," or protected from simultaneous modification by different threads (Savov; Paragraph [0013]).

As per claims 14 and 16, Wang also teaches wherein the signal generation logic is operable to generate a signal indication whether or not the FIFO is full (Wang; Col 9 Lines 11 – 16).

As per claims 15 and 17, Wang also teaches wherein the signal generation logic is operable to generate a signal indication whether or not the FIFO is empty (Wang; Col 9 Lines 17 – 23).

As per claim 18, Wang also teaches wherein the first predefined amount (Wang; Figure 7 Items 154 and 158) comprises a number having the same number of bits as a maximum value of the counter (Wang; Figure 7 Item 148). Figure 7 of Wang shows that the counter (Item 148) has the same number of bits (8) as the predetermined values (Items 154 and 158).



As per claim 19, Wang also teaches wherein the signal generation logic comprises one or more comparators (Wang; Figure 7 Items 156 and 160).

As per claim 21, Wang also teaches wherein the counting semaphore is a counter (Wang; Figure 3 Item 82).

As per claim 22, Wang also teaches wherein the signal generation logic comprises at least one comparator (Wang; Figure 7 Items 156 and 160, Col 9 Lines 11 - 23) for comparing an output of the counter (Wang; Figure 7 Item 82) with a predefined value (Wang; Figure 7 Items 154 and 158) and generating one or more signals based on the comparison (Wang; Col 9 Lines 11 - 23).

As per claim 23, Wang teaches a method comprising maintaining a count (Wang; Col 8 Lines 12 - 30); incrementing the value of the count in response to a first action by a first process (Wang; Col 8 Lines 3 - 52); and taking at least one action in a second process based on the incremented value of the count (Wang; Col 8 Lines 3 - 52).

Wang does not explicitly teach the term "counting semaphore."

However, Savov teaches a counting semaphore (Savov; Paragraph [0014]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Wang to include the term "counting semaphore" because doing so would allow data to be "thread-safe," or protected from simultaneous modification by different threads (Savov; Paragraph [0013]).

As per claim 24, Wang also teaches maintaining a plurality of signals derived from the count (Wang; Col 9 Lines 11 – 23). Savov also teaches wherein a compare operation is an atomic operation (Savov; Paragraphs [0047] – [0049]).

As per claim 25, Wang also teaches wherein the count corresponds to an amount of data contained in a predefined portion of memory (Wang; Col 5 Lines 53 – 57).

As per claim 26, Wang also teaches changing the state of the signals in response to incrementing the value of the count (Wang; Col 9 Lines 5 – 23); and taking at least one action based on the changed state of the first signal (Wang; Col 9 Lines 11 – 23). Savov teaches wherein changing signal states is an atomic operation (Savov; Paragraphs [0047] – [0049]).

As per claim 27, Wang also teaches wherein the plurality of signals comprise an indication of whether the predefined portion of memory is full and an indication of whether the predefined portion of memory is empty (Wang; Figure 7, Col 9 Lines 11 – 23).

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,953,020 (hereinafter Wang) in view of US Patent Application Publication No. 2003/10177164 (hereinafter Savov) and further in view of US Patent No. 6,522,682 (hereinafter Kohli).

As per claim 20, Wang teaches the system as described per claim 13 (see rejection of claim 13 above). Wang also teaches an adder/subtractor (Wang; Figure 3 Item 82, Col 7 Lines 46 – 52 and Col 8 Lines 21 – 30); and one or more comparators operatively connected to an output of the adder/subtractor (Wang; Figure 7 Items 156 and 160, Col 9 Lines 11 – 23).

Wang does not explicitly teach the term “counting semaphore” and incrementing and decrementing of the counting semaphore.

However, Savov teaches a counting semaphore (Savov; Paragraph [0014]) and incrementing and decrementing of the counting semaphore (Savov; Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Wang to include the term “counting semaphore” because doing so would allow data to be “thread-safe,” or

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protected from simultaneous modification by different threads (Savov; Paragraph [0013]).

Wang in combination with Savov does not teach logic implemented as part of the same circuit.

However, Kohli teaches logic implemented as a part of the same circuit (Kohli; Col 13 Lines 54 – 65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the teachings of Wang in combination with Savov because doing so would maximize the speed of correlation and minimize the error (Kohli; Col 13 Lines 54 – 65).

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

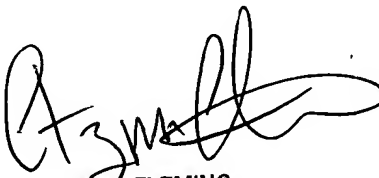
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Franklin whose telephone number is (571) 272-0669. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz Fleming can be reached on (571) 272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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12/15/2006